FACTS ON FILE

EMSP

Environmental Management Science Program

Project Highlights

The Environmental Management Science Program (EMSP) is funding basic research projects focused on solving the most difficult problems that threaten the closure plans of DOE sites. This fact sheet highlights just one.

New Silicotitanate Waste Forms: Development and Characterization

New waste forms and disposal strategies specific to crystalline silicotitanate (CST) secondary waste that are developed in this work will offer an alternative to current disposal plans which call for recombining the separated cesium- and strontium-loaded CST into the high activity waste streams, then dissolving it in borosilicate glass. The goals of this research are to reduce the costs associated with CST waste disposal, to minimize the risk of contamination to the environment during CST processing, and to provide DOE with technical alternatives for CST disposal.

Locations: Pacific Northwest National Laboratory, Sandia National Laboratories, and University of California/Davis

Year of Award: 1997

Amount of Award: $1,200,000

Office of Environmental Management (EM) Problem Area: High Level Waste

Office of Science (SC) Scientific Category/Sub-Category: Materials Science/Chemical and Structural Properties of Storage Materials

Research Value/Impact: To date, leach tests have shown that waste forms with durability orders of magnitude higher than baseline borosilicate glass can be achieved by a simple heat treatment of the cesium-loaded ion exchanger with no additives. Optimum durabilities are achieved at heat treatment temperatures in the range of 800-1000 degrees Celsius. Direct thermal conversion reduces the total volume of waste generated from the ion exchanger by about 40 percent and dramatically simplifies processing. In addition, heat treatment of the ion exchanger coarsens fines, reducing inhalation risk, and completely removes molecular water and hydroxyl groups, eliminating the possibility of radiolytic hydrogen production during storage.

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More Information on the Web:
http://www.em.doe.gov/science or
http://www.id.doe.gov/emsystem/emsp